

**FACT SHEET FOR NPDES PERMIT WA-004557-8**  
**CITY OF DAVENPORT WASTEWATER TREATMENT PLANT**

**SUMMARY**

The City of Davenport owns and operates a facultative lagoon system with discharge to land treatment. The history of the treatment/irrigation capacity has shown that there is insufficient storage in the lagoons and/or insufficient capacity in the irrigation fields to contain and treat all the influent coming into the plant. However, the City has continued the inflow and infiltration removal program over the years and the flows to the wastewater treatment plant appear to have decreased significantly. Over the past year, the influent flow to the treatment facility has consistently remained below the design capacity of the plant.

This permit will not change irrigation discharge limitations from the current permit. Permit will require monitoring for irrigation constituents in the final effluent, soil and crops. From this information, the Permittee can perform a nutrient balance to insure that ground water is not being impacted by the facility discharge. The major change to the permit will be the addition of effluent limitations, monitoring requirements, and storage vs. receiving water flow operational protocols for a controlled discharge outfall to Cottonwood Creek. The controlled discharge is necessary to prevent overtopping the storage lagoon dikes and releasing untreated wastewater into the environment. The treated effluent flow will not exceed a maximum of 4.6 % of the flow in Cottonwood Creek during any controlled discharge event.

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## INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	City of Davenport
Facility Name and Address	City of Davenport Wastewater Treatment Plant P.O. Box 26, Davenport, WA 99122 (509) 725-4352
Type of Treatment:	Aeration treatment and facultative storage lagoons followed by land treatment
Discharge Location	Land Application: Latitude: 47° 40' N; Longitude: 118° 08' W.
Legal Description of Application Area	35 acres within NE ¼ of Sec. 16, T.25 N., R. 37 EWM; 44 acres within SE ¼ of Sec. 9, T.25 N., R. 37 EWM
Discharge Location	Cottonwood Creek: Controlled Discharge Latitude: 47° 39' --" N Longitude: 118° 09' --" W.
Water Body ID Number	AJ38OQ (WA-53-4300)

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## BACKGROUND INFORMATION

### DESCRIPTION OF THE FACILITY

#### HISTORY

The city's treatment system was upgraded to a lagoon system with irrigation in 1986. The effluent was originally irrigated onto 35 acres. The facility design was based on projected removal of a large amount of sewer system infiltration and inflow (I & I). The reduction, however, could not be achieved, and soon after initiation of operation, capacity was exceeded. The Department continued to authorize extensions of the irrigation season.

In 1991, an amendment to the facility plan was prepared to recommend solutions to the facility's problems. The plan concluded that I & I was causing the problems and proposed an expansion of the storage/irrigation system as the most cost-effective solution. The plan recommended an additional 44 acres for irrigation, lift station capacity to be increased to 580 gpm, and construction of a fourth lagoon to increase total storage to 51.7 million gallons. The additional acreage was acquired through condemnation. The recommended upgrade was completed in 1993. Total acreage was increased to 79 acres and total storage capacity to 65 million gallons.

To prevent the lagoon dikes from being overtopped and losing the entire contents into Cottonwood Creek, the City had to discharge to the creek in the spring of 1995, 1996, and 1997. The lagoon storage capacity was significantly exceeded.

The General Sewer Plan and Facilities Plan was again updated to propose a final solution to the treatment and irrigation site capacity problem. This amendment was completed and approved by the Department in February 2001. The recommended alternative included replacement of the influent pump station to increase capacity to pump all flows to the lagoons to prevent discharges of untreated effluent; additional lagoon pipe between the pump station and the lagoon to provide the option of treating all influent flows and a to provide a return pipe to Cottonwood Creek; disinfection for all effluent discharges to Cottonwood Creek; ambient monitoring for the controlled outfall into Cottonwood Creek. The design of these proposed items were completed and approved by the Department and constructed in 2004 and is presently in operation.

Previous effluent and receiving water monitoring was used by the Department to develop permit effluent limitations for the controlled discharge. The construction of the new pump station, additional outfall pipe, and disinfection system are complete and operational. The proposed permit contains requirements for monitoring Cottonwood Creek during high winter flow conditions and storage vs. creek flow protocols to determine if and when a situation will occur and a controlled discharge is warranted. The city will submit this information to the department for review and approval prior to any discharge of treated and disinfected effluent.

#### COLLECTION SYSTEM STATUS

The city has an ongoing I & I correction program. Since the previous permit was written, the city has t.v.'d and repaired large sections of damaged sewer line and pressure grouted manholes. In 1995, the city declared a Sewer Emergency notifying the citizens to conserve water and disconnect sources of inflow such as roof drains and sump pumps. Sewer hookups have been limited, and sump pumps and roof drains continue to be disconnected. In March of 1998, the city again appealed to the citizens to disconnect sump pumps and offered help in doing so.

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The City has made many improvements to their collection system since the recommendations were made in the 1992 *Sewerage Facilities plan Amendment*. The areas that have been improved since 1998 include replacing and lining manholes, replacing old concrete and clay sewer mains, and removing sump pumps that discharge to the sanitary sewer system. Refer to the approved 2002 Facility Plan for the list of sewer projects completed.

The recommended alternative for inflow and infiltration reduction is for the City to complete videotaping the entire system; to continue visual inspections during rainfall events; and to permanently install a flow measuring device upstream of the pump station to determine instantaneous flows.

#### TREATMENT PROCESSES

Influent wastewater is pumped to lagoon #1 for some treatment with basic aeration (solar power aeration system "SolarBee") then through three storage lagoons in series prior to irrigation. Irrigation pump station can be supplied either from storage lagoon #3 or #4 lagoon (Figure 1). Final effluent is irrigated onto the alfalfa fields during the growing season to empty lagoon levels down for winter storage. The city contracts with a local farmer to manage the crop.

During wet years, capacity of the plant may be insufficient to handle peak influent wastewater flow. In the springs of 1996 and 1997, high flows exceeded the capacity of the influent pump station, which resulted in raw, untreated wastewater flowing into the creek. During the same period, treated, chlorinated effluent was piped to Cottonwood Creek to prevent overtopping and possible failure of the lagoon dikes. In 1997, the city used a vactor truck to remove sewage solids from a small wetland between the influent pump station and nearby Cottonwood Creek.

The city completed a General Sewer and Facilities Plan to evaluate problems with the system and to determine the most cost-effective solutions. The 2001 approved Facility Plan recommended a discharge to Cottonwood Creek during high flow periods to prevent overtopping the lagoons. Further ambient monitoring was used to determine the effluent requirements for a discharge and to establish effluent limitations. Further operations of the facility will determine if removal of more inflow and infiltration flows and/or additional treatment is needed in the future.

#### DISTRIBUTION SYSTEM (SPRAYFIELD)

Treated effluent is applied to 79 acres of alfalfa via sprinkler irrigation. Setbacks are adequate for land treatment systems.

Clay lenses in the newest sprayfield apparently limit the amount of water that can be applied without runoff.

The emergency winter high flow outfall was determined to be required, since the lagoons are drawn down to minimum levels during the irrigation season and additional irrigation acreage will not entirely solve the problem caused by excess winter time flows and possible accidental discharges to Cottonwood Creek. Additional irrigation acreage and lagoon capacity is not feasible on the land available to the city in the lagoon area.

#### GROUND WATER

Lysimeters were installed twice to monitor the vadose zone. The lysimeters failed to provide useful data, so the Department gave the city permission to remove them from the fields in 1999.

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This permit will not require ground water monitoring. The Permittee will evaluate ground water impacts by performing nutrient and hydraulic balances using soil, crop and final effluent monitoring data.

#### CONTROLLED DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged from the facility via 8-inch outfall into Cottonwood Creek. See section titled "Controlled Outfall Protocols" below and Permit Condition S1.C for controlled discharge protocols and limitations. The treated effluent flow will not exceed a maximum of 4.6 % of the flow in Cottonwood Creek during any controlled discharge event.

#### PERMIT STATUS

The previous permit for this facility was issued on August 15, 2003, and will expire on June 30, 2008.

The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD<sub>5</sub>), Total Suspended Solids (TSS), pH, and Total Nitrogen.

An application for the NPDES permit was submitted to the Department on May 6, 2005 and accepted by the Department on May 16, 2005.

#### SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on June 29, 2004.

During the history of the previous permit, the Permittee has remained in compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department.

#### WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

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**Table 1: Wastewater Characterization**

<u>Parameter</u>	<u>Concentration (average)</u>
<u>BOD5</u>	<u>18.6 mg/L</u>
<u>TSS</u>	<u>38 mg/L</u>
<u>Total Dissolved Solids</u>	<u>566.4 mg/L</u>
<u>NH3-N</u>	<u>2.35 mg/L</u>
<u>pH</u>	<u>7.9 s.u. min. – 9.2 s.u. max.</u>
<u>Fecal Coliform</u>	<u>1726.7 cfu/100 mL</u>
<u>TKN</u>	<u>8.28 mg/L</u>
<u>O-PO4-P</u>	<u>4.16 mg/L</u>
<u>Chloride</u>	<u>67.5 mg/L</u>

### PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

In 2002, the City received notice that it received funding from the State to complete the first three items of the recommended alternative. These items were completed in 2004 and provide additional protection of Cottonwood Creek. The option of a permitted discharge to Cottonwood Creek and the establishment of effluent limitations and period of discharge was determined after completion of the ambient monitoring work and a data analysis. Since the data collection and analysis is complete; the amended Facilities Plan is approved; and the construction completed, this NPDES permit will be issued to allow for an authorized discharge to Cottonwood Creek.

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### GROUND WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's ground waters including the protection of human health, WAC 173-200-100 states that waste discharge permits shall be conditioned in such a manner as to authorize only activities that will not cause violations of the Ground Water Quality Standards. Drinking water is the beneficial use generally requiring the highest quality of ground water. Providing protection to the level of drinking water standards will protect a great variety of existing and future beneficial uses.

Applicable ground water criteria as defined in Chapter 173-200 WAC and in RCW 90.48.520 for this discharge include the following:

**Table 2: Ground Water Quality Criteria**

Total Coliform Bacteria1	Colony/ 100 mL
Total Dissolved Solids	500 mg/L
Chloride	250 mg/L
Sulfate	250 mg/L
Nitrate	10 mg/L
pH	6.5 to 8.5 standard units
Manganese	0.05 mg/L
Total Iron	0.3 mg/L
Toxics	No toxics in toxic amounts

No valid up-gradient background data were available for listed pollutants. Lysimeters were installed twice to monitor the vadose zone. The lysimeters failed to provide useful data, so the Department gave the city permission to remove them from the fields in 1999. This permit will not require ground water monitoring. The Permittee will evaluate ground water impacts by performing nutrient and hydraulic balances using soil, crop and final effluent monitoring data.

### LAGOON TREATMENT FACILITY LOADING

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the amended December 2000 engineering report prepared by CH2M Hill and amended by the November 2004 Treated Wastewater Emergency Discharge Analysis "Assimilative Capacity in Cottonwood Creek" report prepared by Esvelt Environmental Engineering and are as follows:

Monthly average flow (max. month):	145,250 gpd
Peak wastewater flow:	334,000 gpd
Influent peak flow (I/I plus wastewater):	835,000 gpd
Irrigated effluent total nitrogen:	23.9 ppm
Irrigated effluent phosphorus:	3.5 ppm
Population:	2300

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The permit requires the Permittee to maintain adequate capacity to treat the flows and waste loading to the treatment plant (WAC 173-216-110[4]). For significant new discharges, the permit requires a new application and an engineering report (WAC 173-216-110[5]). The permittee has completed an extensive I&I removal program over the years and have construction a new influent pump station and controlled discharge system. Therefore, the permittee shall re-evaluate the up-graded system and the above design information and submit any proposed amendments during the next permit application process.

#### *CONTROLLED OUTFALL DISCHARGE PROTOCOLS*

A controlled discharge of treated wastewater to Cottonwood Creek and all other activities authorized by this permit shall be consistent with operating protocols for winter lagoon storage and existing flows in Cottonwood Creek and as based on all other terms and conditions of this permit.

The controlled discharge is based on the information provided in the approved "Assimilative Capacity in Cottonwood Creek" report. Based on the analysis outlined in Fact Sheet Section "Consideration of Surface Water Quality-Based Limits for Numeric Criteria" ammonia is the limiting factor for establishing receiving water flows to the controlled discharge flow. Therefore, the effluent flow volume is controlled and limited to approximately 3% of the flow in Cottonwood Creek at the time of the discharge. This additional flow volume is protective of the downstream channel and has been determined not to cause additional erosion of stream banks.

During these controlled discharges, every effort shall be made to protect water quality in the receiving waters. The following protocols shall apply prior to any controlled discharge to Cottonwood Creek:

1. The permittee shall make every effort to ensure that each storage lagoon is at the recommended winter storage volume at the end of the irrigation season.
2. The Permittee shall not discharge to Cottonwood Creek except when normal Level #2 lagoon capacity is expected to be exceeded during the months of January through May (see Figure 1, below).
3. Flows in Cottonwood Creek shall be recorded weekly from October through May of each year. Flows shall be based on staff gage reading located upstream of the weir in the Davenport City Park and from Table 3 "Allowable Controlled Discharge", below.
4. The permittee shall measure water depth in each lagoon on monthly bases during non-irrigation season and determine total stored volume in the lagoons.
5. The permittee shall not activate controlled discharge until department has reviewed and approved by letter the submitted information.
6. Adequate lead time shall be provided for department authorization prior to any controlled discharge and only when receiving water and discharge flows are compatible with permitted protocols.
7. Prior to any controlled discharge, the permittee shall submit a request (by letter) to the department for authorization. The request letter shall include the following information:
  - A. When total stored volume in the lagoons equals or exceeds the Level #1 capacity for that particular month in question, the Permittee shall determine and record total storage volume of lagoons on a weekly basis. See Figure 1 "Lagoon Storage Volume", below.
  - B. See "Appendix - Lagoon Capacity Chart" to determine total stored volume of treated wastewater based on measured lagoon depths above bottom elevations.

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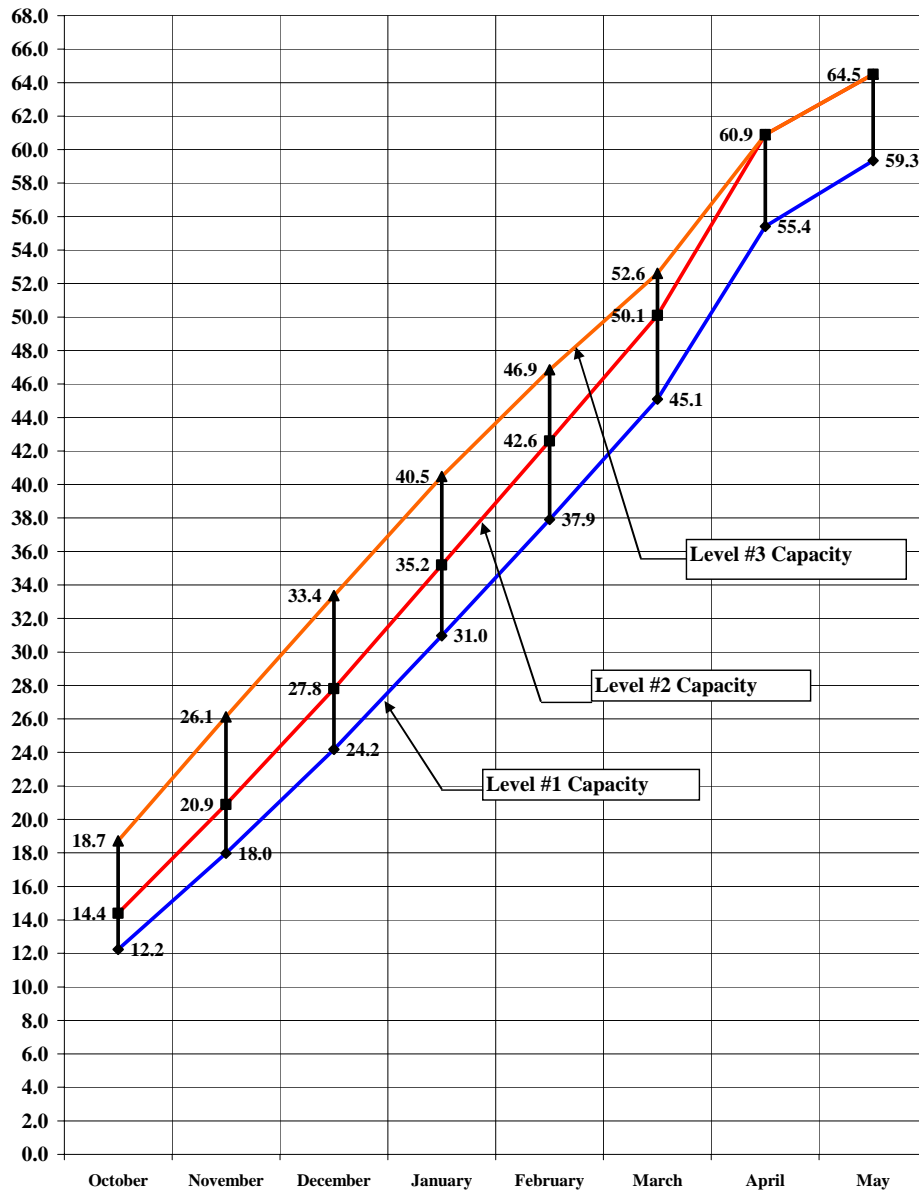
- C. When stored volume of treated wastewater is between the Level #1 and Level #2 capacity ranges, the following information shall be submitted for review and approval:
- The permittee shall estimate the lead time needed for Department's review of submitted information prior to approval of a controlled discharge.
  - The Permittee shall determine the rate of the controlled effluent discharge flow. This controlled discharge flow shall be based on the current recorded Creek flow and corresponding flow values as shown in Table 3, below.
  - The permittee shall determine the duration of controlled discharge based on the rate of discharge determined in Item 6.b, above.
- D. When stored volume of treated wastewater is between the Level #2 and Level #3 capacity ranges. The following additional information may include:
- The permittee shall measure water depth in each lagoon on weekly bases and determine total stored volume in the lagoons.
  - Re-determination of lagoon storage capacity and the rate and duration of controlled discharge to demonstrate that an increase in discharge is crucial.
  - Considerations shall be given as to the month in question, weather forecasts (short or long term), storage capacity available, past operational data of lagoon storage, and
  - The permittee shall meet with the Department Regional Water Quality Permit Manager to review additional information and data to expedite approval of an increase to the rate of the controlled discharge flow to protect loss of dikes.
  - The department recommends that the permittee develop a list of individual concerned property owners that abut Hawk Creek downstream of the discharge point to be notified when a discharge occurs.
6. The permittee shall analyze creek flows and any controlled discharge, water quality in Cottonwood Creek, effluent monitoring data, and the lagoon discharge protocols to determine if amendments are necessary to support changes to protocols for a controlled discharge to Cottonwood Creek.
7. The City shall document monitoring procedures and conditions necessary for a controlled discharge of treated effluent to Cottonwood Creek.
8. Proposed amendments to the controlled discharge and supporting protocols shall be submitted to the department by June 30, 2009.

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**Figure 1: Lagoon Storage Volume Monitoring Protocol**  
(Estimated Maximum Lagoon Storage for No Creek Discharge)



**Table 3 Allowable Controlled Discharge**

The following Table shall be used to determine controlled discharge flow rate at different receiving water flows.

Staff Gage	Creek Flow	Controlled Discharge Flow		
		gpm	MGD	cfs
0.48	14	200	0.288	0.446
0.51	17	225	0.324	0.502
0.54	19	250	0.36	0.557
0.56	21	275	0.396	0.613
0.59	22	300	0.432	0.669
0.61	23	325	0.468	0.724
0.63	26	350	0.504	0.780
0.65	27	375	0.54	0.836
0.68	28	400	0.576	0.892
0.7	30	425	0.612	0.947
0.72	31	450	0.648	1.003
0.74	33	475	0.684	1.059
0.76	34	500	0.72	1.115
0.77	36	525	0.756	1.170
0.79	37	550	0.792	1.226

#### TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD<sub>5</sub>, and TSS are taken from Chapter 173-221 WAC, Sections 040 and 050 are:

**Table 4: Technology-based Limits for controlled discharge.**

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD <sub>5</sub> (concentration)	Average Monthly Limit is the most stringent of the following: - 45 mg/L Average Weekly Limit = 65 mg/L

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Parameter	Limit
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 45 mg/L Average Weekly Limit = 65 mg/L

#### *SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS*

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

#### NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

#### NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

#### NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

#### ANTIDegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More

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information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

#### CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

#### MIXING ZONES

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

#### DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Cottonwood Creek which is designated as a Class A receiving water in the vicinity of the outfall. Characteristic uses include the following:

water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

#### SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	50 organisms/100 mL maximum geometric mean
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Dissolved Oxygen	9.5 mg/L minimum
Temperature	16 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

#### CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed controlled discharge that exceed water quality criteria with technology-based controls which the Department has determined to be AKART. Because the controlled discharge flows are related to the flows in Cottonwood Creek, WAC 173-201A-100 (section 7(a)(ii) and 8(a)(ii)) are used to define the mixing zone. Mixing zones is authorized in accordance with flow restriction and other restrictions for mixing zones and are defined as follows:

The chronic zone not utilize greater than twenty-five percent of the flow; and

The acute zone not utilize greater than two and one-half percent of the flow

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of the pwsread.xls spread sheet. As per the approved "Assimilative Capacity in Cottonwood Creek" report ammonia is the limiting factor for discharge during the high creek flow months. The Critical Chronic dilution factor = 6.51 and the Critical Acute dilution factor = 1.55 was determined to be protective of the water quality of Cottonwood Creek. The discharge will be approximately 4.4% of the total flow at the discharge point.

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water. Analysis outlined above for the various pollutants of concern, ammonia is the most critical. The critical condition for the Cottonwood Creek is based on the amount of effluent discharged. Based on the analysis outlined in the approved Treated Wastewater Emergency Discharge Analysis for the pollutants of concern (ammonia, chlorine, dissolved oxygen, fecal coliform, and metals –arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc) determined that ammonia is the limiting factor for establishing receiving water flows to the controlled discharge flow.

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BOD<sub>5</sub>--Under critical controlled conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitation for BOD<sub>5</sub> was placed in the permit.

The impact of BOD on the receiving water was modeled using pwsread.xls spread sheet, at critical condition and with the technology-based effluent limitation for BOD<sub>5</sub> described under "Technology-Based Effluent Limitations" above.

Temperature--The impact of the discharge on the temperature of the receiving water was modeled by simple mixing analysis at critical condition. The receiving water temperature at the critical condition is 4.6°C and the effluent temperature is 3.2°C. The predicted resultant temperature at the boundary of the chronic mixing zone is 4.44°C (Refer to Table 3 of approved "Assimilative Capacity in Cottonwood Creek" report).

Temperature and pH--The impact of pH and temperature were modeled using the calculations from EPA, 1988. The input variables were dilution factor 6.51, upstream temperature 4.6°C, upstream pH 7.6, upstream alkalinity 200 (as mg CaCO<sub>3</sub>/L), effluent temperature 3.2°C, effluent pH of 7.7, and effluent alkalinity 231 (as mg CaCO<sub>3</sub>/L) (Refer to Table 3 of approved "Assimilative Capacity in Cottonwood Creek" report).

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitations for pH was placed in the permit and temperature was not limited.

Fecal coliform--The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 6.51.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: chlorine, ammonia, and heavy metals. Because effluent flows and creek flows vary, each pollutant of concern was modeled separately to determine which one was controlling for setting creek to effluent flow relationship. Based on the analysis outlined in the approved "Assimilative Capacity in Cottonwood Creek" report and Chronic dilution factor = 6.51 and Acute dilution factor = 1.55 the various pollutants of concern, ammonia was determined to be the most critical constituent governing the allowable discharge volume.

## MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring for ammonia is being required to further characterize the effluent. This pollutant could have a significant impact on the quality of the surface water.

Additional monitoring, called reapplication monitoring in the permit, is required to prepare the Permittee to meet the requirements of the next permit application.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 1994) for a lagoon treatment and irrigation system.

## OTHER PERMIT CONDITIONS

### REPORTING AND RECORDKEEPING

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

### PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4. restricts the amount of flow.

### OPERATION AND MAINTENANCE (O&M)

The proposed permit contains condition S.5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

Inflow and infiltration have been documented in the City of Davenport collection system and need to be further characterized. Significant portions of the collection system are sixty years old, were constructed using techniques such as concrete pipes with oakum packing and/or have numerous manholes which were not installed using modern materials. Therefore, due to the age and construction methods employed during installation of the collection system, leaks are expected to be present. The permit will require the collection system to be characterized for the presence of leaks. Following characterization of the leaks, corrective actions may be required.

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*PRETREATMENT*

WAC 173-216-110 requires that the list of prohibitions in WAC 173-216-060 be included in the permit.

*GENERAL CONDITIONS*

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal state and NPDES permits issued by the Department.

**PERMIT ISSUANCE PROCEDURES**

*PERMIT MODIFICATIONS*

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

*RECOMMENDATION FOR PERMIT ISSUANCE*

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for five years.

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## REFERENCES FOR TEXT AND APPENDICES

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1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

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Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

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## APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on June 30 and July 7, 2005 in the Davenport Times to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on December 1, 2005, in the Davenport Times to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator  
Department of Ecology  
Eastern Regional Office  
4601 North Monroe Street  
Spokane, WA 99205-1295

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (509)329-3537, or by writing to the address listed above.

This permit and fact sheet were written by Jerry Anderson.

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## APPENDIX B--GLOSSARY

**Acute Toxicity**--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

**AKART**-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

**Ambient Water Quality**--The existing environmental condition of the water in a receiving water body.

**Ammonia**--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

**Average Monthly Discharge Limitation** --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

**Average Weekly Discharge Limitation** -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Best Management Practices (BMPs)**--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

**BOD<sub>5</sub>**--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD<sub>5</sub> is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

**Bypass**--The intentional diversion of waste streams from any portion of a treatment facility.

**CBOD<sub>5</sub>** – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celcius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD<sub>5</sub> is given in 40 CFR Part 136.

**Chlorine**--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

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**Chronic Toxicity**--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

**Clean Water Act (CWA)**--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

**Combined Sewer Overflow (CSO)**--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

**Compliance Inspection - Without Sampling**--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

**Compliance Inspection - With Sampling**--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

**Composite Sample**--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

**Construction Activity**--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

**Continuous Monitoring** --Uninterrupted, unless otherwise noted in the permit.

**Critical Condition**--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

**Dilution Factor**--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

**Engineering Report**--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

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**Fecal Coliform Bacteria**--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

**Grab Sample**--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

**Industrial User**-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

**Industrial Wastewater**--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

**Infiltration and Inflow (I/I)**--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

**Interference** -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

**Major Facility**--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Maximum Daily Discharge Limitation**--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Method Detection Level (MDL)**--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

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**Minor Facility**--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Mixing Zone**--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

**National Pollutant Discharge Elimination System (NPDES)**--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

**Pass through** -- A discharge which exits the POTW into waters of the-State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

**pH**--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

**Potential Significant Industrial User**--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

**Quantitation Level (QL)**-- A calculated value five times the MDL (method detection level).

**Significant Industrial User (SIU)**--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority\* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

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Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority\* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

\*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

**State Waters**--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

**Stormwater**--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

**Technology-based Effluent Limit**--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

**Total Suspended Solids (TSS)**--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

**Upset**--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

**Water Quality-based Effluent Limit**--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

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CELL 1				CELL 2				CELL 3				CELL			
Bottom Elev. = 4238.38				Bottom Elev. = 4234.88				Bottom Elev. = 4232.88							
Depth			Storage	Depth			Storage	Depth			Storage	Dep			
0.0	277412	0	0	0.0	295509	0	0	0.0	544164	0	0	0			
0.5	280625	1043529	1,043,529	0.5	299063	1111849	1,111,849	0.5	548625	2043515	2,043,515	1.0			
1.0	283856	1055579	2,099,109	1.0	302634	1125172	2,237,021	1.0	553104	2060233	4,103,749	2.0			
1.5	287105	1067697	3,166,806	1.5	306224	1138564	3,375,585	1.5	557601	2077018	6,180,767	3.0			
2.0	290372	1079882	4,246,688	2.0	309831	1152022	4,527,607	2.0	562116	2093871	8,274,638	3.5			
2.5	293657	1092134	5,338,822	2.5	313457	1165548	5,693,154	2.5	566649	2110791	10,385,428	4.0			
3.0	296960	1104454	6,443,276	3.0	317100	1179141	6,872,295	3.0	571200	2127778	12,513,206	4.5			
3.5	300281	1116841	7,560,116	3.5	320762	1192801	8,065,096	3.5	575769	2144832	14,658,038	5.0			
4.0	303620	1129295	8,689,411	4.0	324441	1206529	9,271,625	4.0	580356	2161954	16,819,992	5.5			
4.5	306977	1141816	9,831,228	4.5	328139	1220324	10,491,948	4.5	584961	2179143	18,999,135	6.0			
5.0	310352	1154405	10,985,633	5.0	331854	1234186	11,726,134	5.0	589584	2196399	21,195,534	6.5			

APPENDIX C—LAGOON CAPACITY CHART

5.5	594225	2213723	23,409,257	7.0			
6.0	598884	2231114	25,640,370	7.5			
6.5	603561	2248572	27,888,943	8.0			
7.0	608256	2266098	30,155,040	8.5			
				9.0			
				9.5			
				10.0			
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## APPENDIX D--RESPONSE TO COMMENTS

**COMMENT:** (December 15, 2005, - Phone call @ 9:53 AM)

Downstream resident, Arlene Kosberg: Expressed concern over the discharge of wastewater into Cottonwood Creek without a requirement to have additional options for treatment and disposal. Because of this concern, she requested that additional recommendations be included in the permit so the permittee will evaluate future options for treatment in lieu of disposal. (See Condition S4.E(5))

### RESPONSE:

Explained that the permit includes in Section S4.E (Infiltration and Inflow Evaluation) requirements that the permittee continue the I/I removal program and submit an annual report on the progress. This program has been extremely successful over the years in removing I/I and reducing total yearly flows to the wastewater treatment lagoon and storage basins. Because of the success of the program, the probability that a controlled discharge will occur is quite low. However, an additional requirement was included to complete a flow monitoring analysis of the collection system to verify reduction in I/I flows. This information shall be included in the last year annual I/I report (2010) and for determining continuation of the I/I program and re-assessing future options for disposal of wastewater effluent.

**COMMENT:** (December 22, 2005, - Phone call @ 10:40 AM)

Downstream resident, Gordon Ellis: Expressed concern over the discharge of wastewater into Cottonwood Creek and concern about additional options for treatment and disposal. Because of this concern, Gordon also expressed that additional recommendations be included in the permit so downstream property owners that abut Hawk Creek be contacted when the controlled discharge occurs.

### RESPONSE:

Explained that Infiltration and Inflow Evaluation (I/I) removal program has been extremely successful over the years in removing extraneous flows and reducing total yearly flows to the wastewater treatment lagoon and storage basins. Because of the success of the program, the probability that a controlled discharge will occur is quite low. However, an additional recommendation was included that the affected property owners would be contacted.

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